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DETAILED DESCRIPTION

[Detailed explanation of the device]

[0001]

[Industrial Application]

About the equipment for inspecting facilities occult blood, although this design also acts as whom [of the abnormalities, such as a digestive system,], it is related with the simple facilities occult blood test equipment which makes it possible to screen easily.

[0002]

[Description of the Prior Art]

Facilities and urine are used as a clinical laboratory test sample today in many cases in addition to blood. Especially, detection of facilities occult blood is dramatically effective in the early detection of the alimentary disease represented by cancer, ulcer, etc.

[0003]

If the detecting method of facilities occult blood is roughly divided, it can be classified into a chemical stool occult blood test method and an immunological stool occult blood test method. A chemical stool occult blood test method uses coloring of the color source object based on the peroxidase activity of HEMO contained from hemoglobin, and sensitivity has the feature that very a small amount of hemoglobin can also be detected highly therefore. However, in order for this reaction not to have singularity to human hemoglobin and to react also to hemoglobin of an animal, the subject had the fault of needing dietary restriction in advance of an inspection.

[0004]

On the other hand, an immunological stool occult blood test method uses the antigen-antibody reaction which used the anti human hemoglobin antibody. An immunological stool occult blood test method has high singularity compared with a chemical stool occult blood test method, and does not need the above dietary restrictions.

[0005]

The method which a judgment is usually performed by immune serum study detection method, and is most used in the immunological stool occult blood test method today is latex agglutination. Latex agglutination is a diagnosis which has a look at the aggregation image which can do a facilities solution and a latex reagent by making it mix on a judgment board. The following operations are required in order to detect facilities occult blood by the above-mentioned latex agglutination based on an immunological principle.

[0006]

First, optimum dose of facilities are extracted, the extracted facilities are dissolved in liquids, such as a physiological saline, and a facilities sample solution is produced. In a facilities sample solution, since the undigested solid content in facilities remains, this is removed using a filter etc. Various proposals are made about these operations until now.

[0007]

For example, the structure of extracting facilities quantitatively is indicated by JP,S61-102941,U, JP,H1-158964,U, etc. The device for obtaining the facilities sample solution from which solid content was removed is indicated by JP,H2-21557,U, JP,H2-140468,U, JP,H2-13977,Y, etc.

[0008]

As mentioned above, various structures are proposed about the process until it obtains a facilities sample solution. However, the facilities sample solution and anti human hemoglobin antibody sensitization reagent which were obtained are mixed, and the inspection system which can perform even mixing of facilities occult blood is not obtained at present.

[0009]

[Problem(s) to be Solved by the Device]

Although simple test equipment is established as what used the chemical stool occult blood test method among the facilities occult blood detecting methods mentioned above, since the nonspecific reaction is used theoretically, it is easy to be influenced by food or a drug. Therefore, as mentioned above, there was a fault that dietary restriction etc. were needed.

[0010]

On the other hand, the thing using an immunological stool occult blood test method has theoretically high singularity, and its sensitivity for facilities occult blood detection is also high. However, the judgment of the agglutination reaction took skill and there was a fault that the composition as a system was complicated. That is, although the conventional structure mentioned above makes simple operation until it obtains a facilities sample solution, it does not make it possible to mix future processes, i.e., the obtained facilities sample solution, and an anti human hemoglobin antibody sensitization reagent, and to perform even detection of facilities occult blood. Therefore, if the judgment board, the reagent, and the stirring rod were prepared, respectively and the skilled worker did not judge them, facilities occult blood was not able to be detected correctly.

[0011]

The purpose of this design cancels many conventional faults mentioned above, and the immunological stool occult blood test method is used for it.

And although acted as whom [of from extraction of a facilities sample to the detection of facilities occult blood], it is in providing the facilities occult blood test equipment which can be carried out simply.

[0012]

[Means for solving problem]

The feces sampling instrument which has a stool sampling stick for being fixed to the inner surface of said lid so that it may become movable [this design] in a lid and the length direction, and extracting a facilities sample, So that it may be stored in the buffer solution container with which the channel which the feces sampling instrument is attached removable and results outside at a lower part was formed, and the buffer solution container and the buffer solution for dissolving a facilities sample and a channel may be blockaded, And the separation filter for being provided in the downstream rather than the sealant punched by moving a stool sampling stick, and the sealant of the channel, and removing the solid content in the facilities sample solution, It is facilities occult blood test equipment provided with the measuring vessel opened for free passage by the channel in the state where it is attached to the buffer solution container, enabling free attachment and detachment, and was attached, and the anti human hemoglobin antibody sensitization reagent currently fixed in the measuring vessel.

[0013]

[Function]

In the facilities occult blood checking equipment of this design, a facilities sample is extractable from feces with a feces sampling instrument. After this feces sampling instrument extracts a facilities sample, it is made removable in a buffer solution container so that it may be attached to a

buffer solution container.

[0014]

Buffer solution is stored in the above-mentioned buffer solution container, and the sample to which the stool sampling stick fixed to the inner surface of a lid adheres is dissolved in buffer solution by attaching a feces sampling instrument to a buffer solution container.

[0015]

By moving a stool sampling stick and punching a sealant, the obtained facilities sample solution flows into the above-mentioned channel, and solid content is removed by the separation filter in this channel.

[0016]

Since it is dropped at the measuring vessel attached to the buffer solution container and the anti human hemoglobin antibody sensitization reagent is being fixed in this measuring vessel, in a measuring vessel, the facilities sample solution which passed the separation filter can judge the existence of facilities occult blood by viewing.

[0017]

As mentioned above, if the facilities occult blood checking equipment of this design is used, it starts in extraction of the facilities sample from feces, and all the operations to measurement by the immunologic procedure of facilities occult blood can be performed simple.

[0018]

[Working example]

Hereafter, this design is clarified by describing an working example, referring to Drawings.

[0019]

Drawing 1 is drawing of longitudinal section showing the facilities occult blood test equipment concerning one working example of this design, and drawing 2 is a perspective view showing the appearance.

The facilities occult blood test equipment 1 of this example has the feces sampling instrument 2, the buffer solution container 3, and the measuring vessel 4. The details of the composition of these components are explained.

[0020]

The feces sampling instrument 2 has the lid 5 and the feces sampling instrument 6 fixed to the inner surface of the top panel of the lid 5. The lid 5 comprises an approximately cylindrical component which has the top panel 5a.

The internal thread 5b is formed in inner skin.

The internal thread 5b is formed so that it may screw with the screw thread 3a formed in the peripheral face of the upper part of the below-mentioned buffer solution container 3. Therefore, the feces sampling instrument 2 may be attached to the buffer solution container 3, enabling free attachment and detachment.

[0021]

The top panel 5a of the lid 5 is formed quite thinly like a graphic display, and by pressing the top panel 5a with a finger by it, it is constituted so that the stool sampling stick 6 fixed to the inner surface can move caudad. That is, the stool sampling stick 6 is being fixed to the inner surface of the top panel 5a so that it may become movable in accordance with the length direction.

[0022]

It is required to comprise the thickness and material which may be caudad bent by the above-mentioned lid 5 when the top panel 5a is pressed with a finger, and it is constituted from this example by the synthetic resin. But when the top panel 5a is pressed with a finger, as long as the top panel 5a may be sagged caudad, the lid 5 may consist of other materials, such as metal.

[0023]

The stool sampling stick 6 has the mounting part 6a which has a big path relatively, the shank 6b, and the puncturing part 6c which has the sharp tip provided at the tip of the shank 6b, although the

whole comprises a substantially rod-shaped synthetic resin material. It is being fixed to the inner surface of the top panel 5a of the lid 5 by adhesion etc. in the above-mentioned mounting part 6a. But the stool sampling stick 6 may be formed in the lid 5 and one.

[0024]

The puncturing part 6c formed at the tip of the stool sampling stick 6 has the sharp form which the tip sharpened like a graphic display. This is for making it easy to break through the below-mentioned sealant 7.

[0025]

In the middle of the puncturing part 6c, two or more unevenness of 6 d is formed.

It is supposed by this unevenness of 6 d that it is possible to extract the facilities sample of the specified quantity out of feces.

It may be constituted from other materials, such as metal other than a synthetic resin, by the above-mentioned stool sampling stick 6.

[0026]

The buffer solution container 3 has approximately cylindrical form, and the screw thread 3a mentioned above near the upper bed of a peripheral face is formed.

It is supposed that it is possible to attach the feces sampling instrument 2 by it.

The buffer solution 8 is stored in the buffer solution container 3. The buffer solution 8 is stored in order to dissolve a facilities sample. As buffer solution which can be used, the neutral salting in liquid of ammonia buffer solution, glycine buffer solution, a phosphate buffer solution, tris buffers, etc. is used, and, as for a pH value, it is preferred that it is the range of 6.5–8.5.

[0027]

Although the buffer solution container 3 is constituted by synthetic resins, such as polyethylene, polypropylene, or vinyl chloride resin, it may comprise other materials, such as metal. Although the capacity in particular of the portion by which the buffer solution 8 in the buffer solution container 3 is stored is not restricted, it is preferred to be referred to as about 1–10 ml.

[0028]

The opening is formed in the upper part of the buffer solution container 3, and the surplus facilities removal lid 9 is being fixed up and down so that this opening may be covered. The surplus facilities removal lid 9 may be formed in the buffer solution container 3 and one with the synthetic resin and identical material which constitute the buffer solution container.

[0029]

The surplus facilities removal lid 9 has the breakthrough 9a for having the form caudad projected in the center, and removing surplus facilities in the center. When the stool sampling stick 6 which extracted the facilities sample passes the breakthrough 9a, the path of the breakthrough 9a is chosen so that the facilities of surpluses other than the facilities currently extracted in the crevice with an above-mentioned unevenness of 6 d can be removed to the upper surface side of the surplus facilities removal lid 9.

[0030]

The channel 10 is formed under the portion in which the buffer solution container 8 is stored.

The channel 10 is formed in the bottom of the portion by which the buffer solution container 8 is stored by this example, and it adheres to the sealant 7 so that this channel 10 may be closed. The sealant 7 is formed so that the buffer solution 8 may not always flow into the channel 10 side.

And it is formed in the material and thickness which are broken through by the puncturing part 6c at the tip of the stool sampling stick 6 when dropping the stool sampling stick 6.

As such a sealant 7, for example, hot melt heat sealing can be used.

[0031]

Down the channel 10, the 1st and 2nd separation filter 11 and 12 is attached. The 1 separation filter 11 of ** is formed in order to remove the insoluble solid matter in a facilities sample solution.

For example, it is constituted by demarcation membranes, such as a publicly known filter paper and a nitrocellulose, or the filter material.

[0032]

The 2nd separation filter 12 is formed in order to remove the solid content in a facilities sample solution similarly.

It is constituted by the cellulose type and the synthetic macromolecule system porous material. The average pore size of this porous material shall be about 0.1–2 micrometers preferably.

[0033]

The measuring vessel 4 comprises a cylindrical synthetic resin vessel of the owner bottom which has an opening up. The anti human hemoglobin antibody sensitization reagent 13 is being fixed to the bottom of the measuring vessel 4.

[0034]

The internal thread 4a is formed in inner skin near the upper bed of the measuring vessel 4.

This internal thread 4a is constituted so that it can screw in the screw thread 3b formed in the peripheral face near the lower end of the buffer solution container 3.

Therefore, the measuring vessel 4 can be removed from the buffer solution container 3 by being able to attach the buffer solution container 3 caudad like a graphic display, and solving screwing with the above-mentioned screw thread 3b and the internal thread 4a.

[0035]

The above-mentioned anti human hemoglobin antibody sensitization reagent 13 carries out sensitization of the anti human hemoglobin antibody to an antibody. As a carrier which carries out sensitization of the antibody, although gold colloid particles and a silica gel particle can be used, it is preferred to use polystyrene latex particles. Sensitization of the anti human hemoglobin antibody to a carrier can be performed by the publicly known physical-adsorption method or a chemical-absorption method.

[0036]

For example, the latex surface can be made to carry out physical adsorption of the anti human hemoglobin antibody by mixing the buffer solution of an anti human hemoglobin antibody to latex 1weight %, and stirring at 37 ** for 1 to 2 hours. If same operation is performed on the surface using the latex which has a carboxyl group, chemical absorption of the anti human hemoglobin antibody can be carried out to latex via a covalent bond by **.

[0037]

As a fixing method to the anti human hemoglobin antibody sensitization reagent 13 to the above-mentioned measuring vessel 4, The reagent which carried out sensitization of the anti human hemoglobin antibody beforehand is fixed on the judgment board (not shown), and the method of arranging this judgment board on the bottom of the measuring vessel 4 or the method of making the bottom of the measuring vessel 4 fix a direct anti human hemoglobin antibody sensitization reagent can be used.

[0038]

Immobilization to the judgment board of a reagent or the bottom of the measuring vessel 4 can be performed by dropping a reagent on these components and drying it at ordinary temperature for 12 to 24 hours. Since a coat can be formed and scattering of a reagent can be prevented if polysaccharide, such as cellulose, hemicellulose, and pectin, is mixed with a reagent and it is made to dry when fixing, more perfect immobilization is possible.

[0039]

Quantity of the above-mentioned anti human hemoglobin antibody sensitization reagent is used as the anti human hemoglobin antibody sensitization reagent of a solution 1weight % with the facilities occult blood test equipment of this example, and a 20–50microl grade is optimum dose.

[0040]

In the facilities occult blood test equipment of this example, first, the above-mentioned lid 2 is removed from the buffer solution container 3, the tip of the stool sampling stick 6 is pierced into feces, and a facilities sample is extracted. Surplus facilities can be removed when passing the breakthrough 9a of the surplus facilities removal lid 9, and a facilities sample can be made immersed in the buffer solution 8 semi-quantitatively by attaching the feces sampling instrument 2 to the buffer solution container 3 like a graphic display after an appropriate time. by upsetting the buffer solution container 3 in the state, a facilities sample is dissolved in the buffer solution container 8, and facilities sample-solution liquid is obtained — things can be carried out. The sealant 7 is broken through with the stool sampling stick 6b, and the channel 11 is made to flow down a facilities sample solution by pressing the top panel 5a of the lid 5 caudad from the state of a graphic display. The facilities sample solution from which the insoluble solid content in a facilities sample solution was removed by the 1st and 2nd separation filter 11 and 12, and solid content was removed is dropped in the measuring vessel 4. And the dropped facilities sample solution is mixed with a reagent on the anti human hemoglobin antibody sensitization reagent 13. Therefore, the existence of facilities occult blood can be measured by removing the measuring vessel 4 from the buffer solution container 3, and observing the inner bottom of the measuring vessel 4.

[0041]

Drawing 3 is a sectional view for explaining the facilities occult blood test equipment concerning the 2nd working example of this design. Since it is constituted almost like the facilities occult blood test equipment 1 of the 1st working example, the facilities occult blood test equipment 21 of the 2nd working example omits the explanation by explaining only a different portion and attaching the reference number same about identical parts as the 1st working example.

[0042]

The lid 5 of the feces sampling instrument 2 is constituted from facilities occult blood test equipment of the 2nd working example by the upper part using the cylindrical body 22 which has an opening. Near the upper bed of the inner skin of the cylindrical body 22, the annular projection 22a which projects inside is formed.

The elastic plate 23 is being fixed to the upper part of this annular projection 22a.

The stool sampling stick 6 is being fixed to the undersurface of the elastic plate 23. The elastic plate 23 comprises material which has rubber elasticity, such as crude rubber or a synthetic rubber. Therefore, the stool sampling stick 6 can be easily moved caudad by pressing this elastic plate 23 with a finger.

[0043]

The plate 24 has adhered so that the upper bed of the cylindrical body 22 may be covered. The plate 24 consists of a synthetic resin, metal, etc., and it is constituted so that it may have a certain amount of rigidity.

It is constituted so that the elastic plate 23 may not be accidentally pressed with a finger by it. The plate 24 is projected outside the peripheral face of the cylindrical body 22 in the part. This portion 24a projected is formed in order to make it easy to remove the plate 24 from the upper bed side of the cylindrical body 22.

[0044]

In the 2nd working example, structure of the feces sampling instrument 2 is different-****(ed) with the feces sampling instrument 2 of the 1st working example as mentioned above. Other points are the same as the 1st working example.

Next, the directions for the facilities occult blood test equipment 21 of the 2nd working example shown in drawing 3 are explained more to details with reference to drawing 4 – drawing 10.

[0045]

As shown in drawing 4, using the feces sampling instrument 2, the stool sampling stick 6 of the feces sampling instrument 2 is thrust into the feces A, and a facilities sample is extracted by pulling up the feces sampling instrument 2 after an appropriate time.

Next, as shown in drawing 5, the feces sampling instrument 2 is attached to the buffer solution container 3. In this case, when the stool sampling stick 6 passes the breakthrough 9a of the surplus facilities removal lid 9, surplus facilities A' is discharged by the upper surface of the surplus facilities removal lid 9. Therefore, while a constant rate of facilities samples had been extracted by the uneven part 6d of the stool sampling stick 6, it is immersed in the buffer solution 8.

[0046]

Next, as shown in drawing 6, where it thrust the lid 5 of the feces sampling instrument 2 into the buffer solution container 8 and it is attached, fall mixture of the facilities occult blood test equipment 21 whole is carried out. Thereby, a facilities sample is dissolved in the buffer solution 8, and facilities sample-solution liquid is obtained.

[0047]

Next, as shown in drawing 7, the plate 24 of an upper bed is removed and the elastic plate 23 is exposed. Then, press the elastic plate 23 with the finger C from the upper part, it is made to bend, as the alternate long and short dash line of a graphic display shows, the sealant 17 is broken through, and it is made to flow down a facilities sample solution in the channel 10, as shown in drawing 8.

[0048]

Next, the facilities sample solution which has flowed down is made dropped from the separation filters 11 and 12 by pressing the buffer solution container 3 with the finger D, as shown in drawing 9.

The facilities sample-solution liquid and the anti human hemoglobin antibody sensitization reagent 13 which were dropped are made to react by making the facilities occult blood test equipment 1 whole rock, as shown in drawing 10 after an appropriate time.

[0049]

The existence of facilities occult blood is judged by removing the measuring vessel 4 from the buffer solution container 3, and observing the existence of the degree of aggregation in the bottom by viewing after an appropriate time.

As mentioned above, if the facilities occult blood test equipment 21 of this example is used, it is possible to perform them simple, without requiring skill, although acted as whom [of especially a series of operations from feces sampling to a judgment].

[0050]

Although that in which two or more unevenness of 6 d was formed as the stool sampling stick 6 was illustrated, as long as facilities can be extracted semi-quantitatively in addition to the form of a graphic display about this unevenness of 6d, the hollow of various form, a projection, or a hole may constitute from the 1st and 2nd working example.

[0051]

It is good also as a structure of attaching it in the feces sampling instrument 2 by choosing the outer diameter of not only the thing using the screw thread mentioned above but the buffer solution container 3, and the inside diameter of the feces sampling instrument 2 also about the attachment to the buffer solution container 3 of the feces sampling instrument 2 as the buffer solution container 3 is pressed fit and obtained. Similarly, also about the fitting structure of the buffer solution container 3 and the measuring vessel 4, as mentioned above, it is good also as a structure which presses one side fit in another side by choosing not only the thing using a screw thread but both path, and disclosure of facilities sample-solution liquid can be prevented by it.

[0052]

[Effect of the Device]

According to this design, the measuring vessel in which the anti human hemoglobin antibody sensitization reagent for making the buffer solution container with which the buffer solution for producing the feces sampling instrument and facilities sample solution which have the above-mentioned stool sampling stick was stored, and immunoreaction start was fixed is constituted by

one, enabling free attachment and detachment. Therefore, although acted as whom [of a series of operations from feces sampling to a judgment] as mentioned above, without requiring skill so much, it can carry out easily.

[0053]

And after inspection finish, generating of an unpleasant smell and disclosure of facilities sample-solution liquid can be prevented by unifying a feces sampling instrument, a package body, and a measuring vessel. Therefore, processing after an inspection can be performed sanitarily and easily.

[0054]

Since it will face that a separation filter removes solid content from a facilities sample solution and a facilities sample solution will once be stored on a separation filter if the facilities occult blood test equipment of this design is used, the concentration of the facilities sample-solution liquid first dropped on an anti human hemoglobin antibody sensitization reagent does not become thin.

Therefore, since an anti human hemoglobin antibody sensitization reagent and a facilities sample solution react correctly, the existence of facilities occult blood can be judged certainly.

[Translation done.]

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CLAIMS

[Claims]

[Claim 1]A feces sampling instrument which has a stool sampling stick for being fixed to an inner surface of said lid so that it may become movable in a lid and the length direction, and extracting a facilities sample, So that it may be stored in a buffer solution container with which a channel which said feces sampling instrument is attached removable, and results outside at a lower part was formed, and said buffer solution container and buffer solution for dissolving a facilities sample and said channel may be blockaded, And a separation filter for being provided in the downstream rather than a sealant punched by moving said stool sampling stick, and a sealant of said channel, and removing solid content in the facilities sample solution, Facilities occult blood test equipment provided with a measuring vessel opened for free passage by channel in the state where it is attached to said buffer solution container, enabling free attachment and detachment, and was attached, and anti human hemoglobin antibody sensitization reagent ***** currently fixed in said measuring vessel.

[Translation done.]

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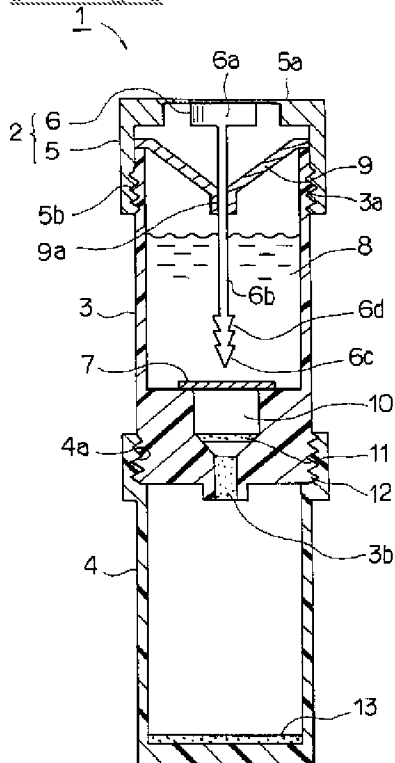
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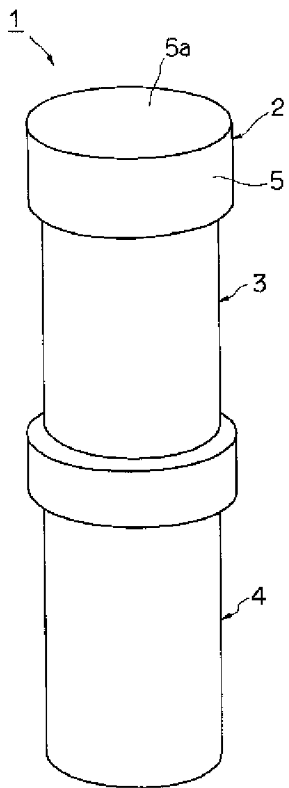
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DRAWINGS

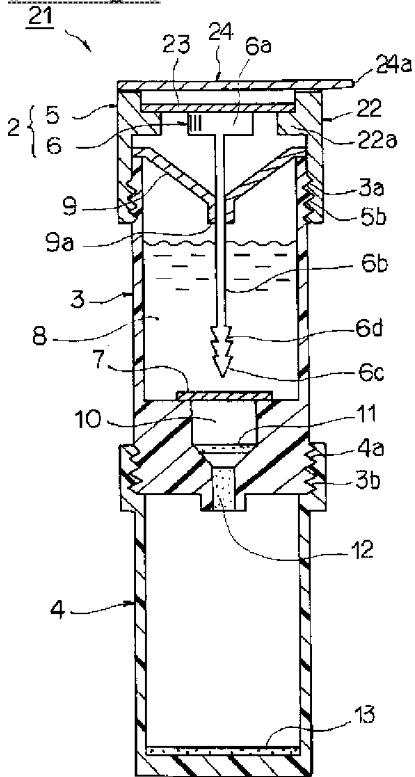
[Drawing 1]



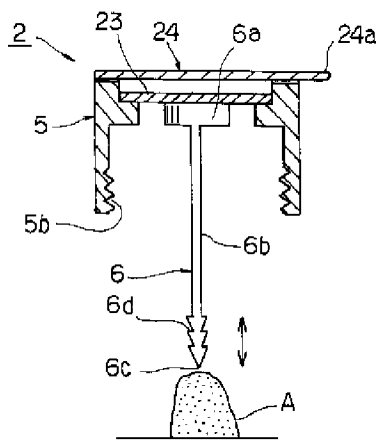
[Drawing 2]



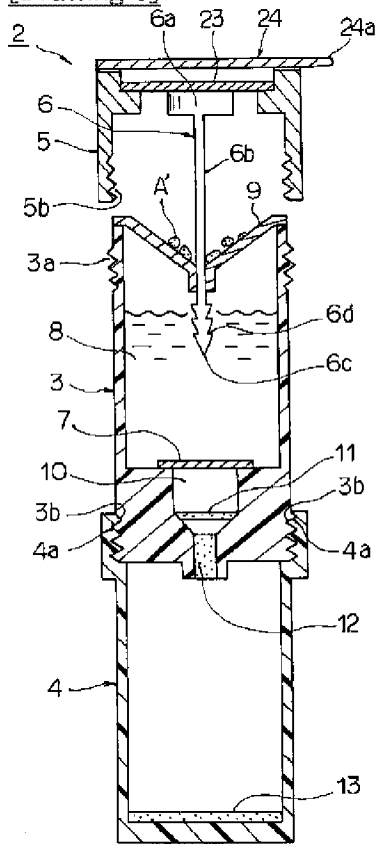
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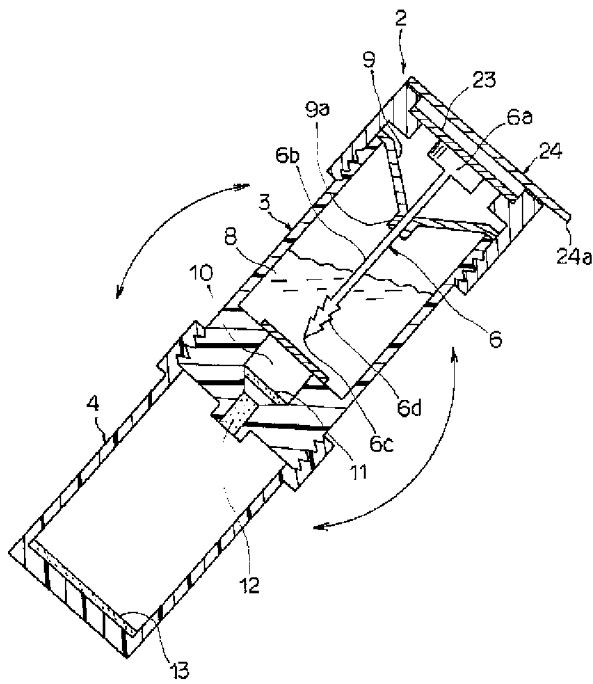
[Drawing 4]



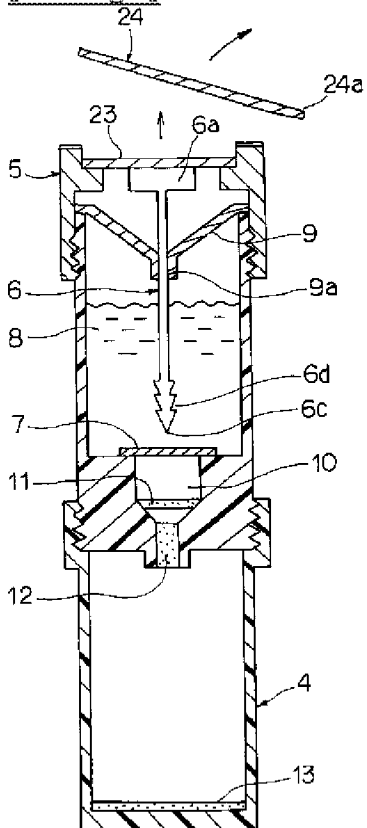
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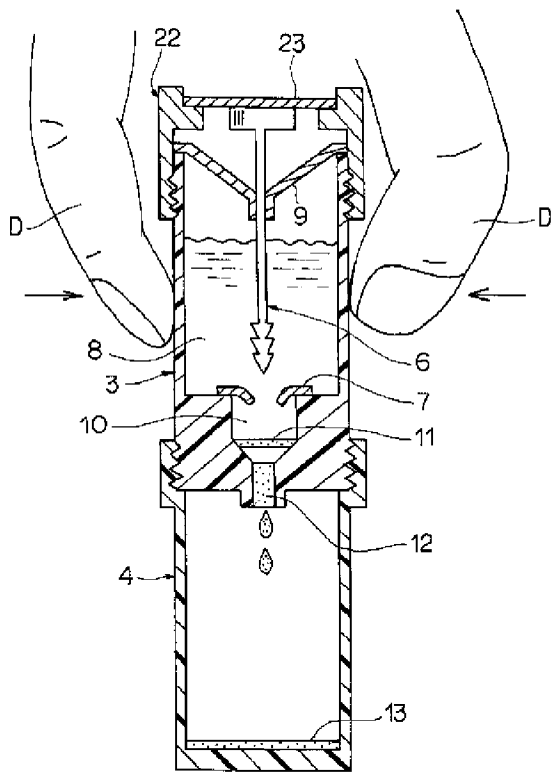
[Drawing 6]



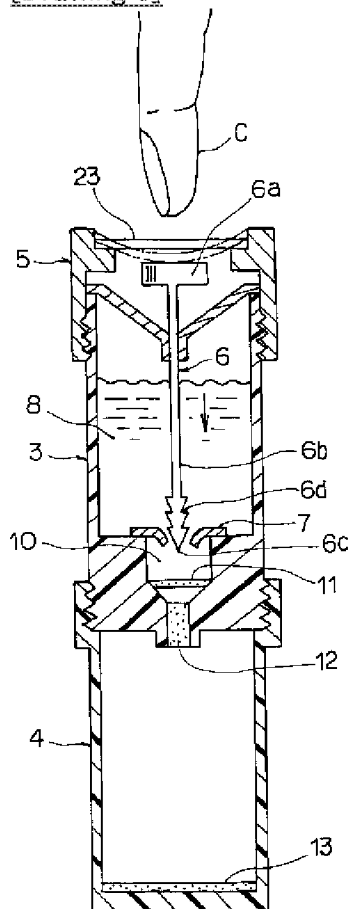
[Drawing 7]



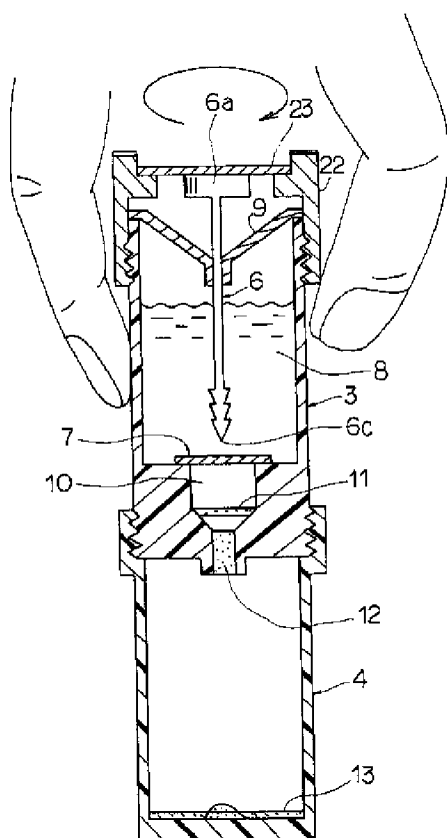
[Drawing 9]



[Drawing 8]



[Drawing 10]



[Translation done.]